

- Fig. 7. Gill, *H. canadensis*.
Fig. 8. Labium and 2nd maxilla, *H. tripunctata*.
Fig. 9. First maxilla, *H. tripunctata*.
Fig. 10. Mandible, *H. tripunctata*.
Fig. 11. Labrum, *H. tripunctata*.
Fig. 12. *Hypopharynx*, *H. tripunctata*.
Fig. 13. Genitalia, *H. tripunctata*.
Fig. 14. Gill, *H. tripunctata*.

(TO BE CONTINUED.)

A JUMPING MAGGOT WHICH LIVES IN CACTUS
BLOOMS (*ACUCULA SALTANS*, GEN.
ET SP. NOV.).

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On January 25, 1913, the writer was exploring a rocky draw among the bare hills in the western base of the Andes, above Santa Ana ranch house, about forty miles inland from Lima, and at about 4,000 feet elevation above sea. In this draw a columnar cactus was found growing in bunches, probably *Cereus* sp., which at that date showed few blooms opened, but many unopened buds. One large bud evidently past opening time, and in reality a bloom whose opening had been prevented by the shrivelling of the petals which effectually closed it, was cut open and disclosed five maggots that possess the power of jumping six or eight inches high from a hard surface. The cactus buds were all numerously attended by a large brown ant, specimens of which have been sent to Dr. Wheeler for determination, and the closed bloom containing the maggots was simply massed with the ants on the outside, much more so than the buds in general, yet no entrance had been effected by them into this bloom. The bloom was cut open with the idea that the ants were inhabiting it, and thus the discovery of the maggots was purely accidental. The maggots were found to be boring among the cotted mass of stamens and anthers. Fermentation of the mass was evident from the sour odour, but no actual putrefaction had taken place. The maggots had not penetrated the septum covering the

ovarial chamber, and the developing seeds appeared to be in normal condition.

Description of Third-stage Maggot.—Length, extended, 9 to 10 mm. Pale yellowish or straw-colored, anal plates and cephalopharyngeal skeleton black. Mandibular hook double, not coalesced. Anal plate in one transverse piece of chitin, with a sharp spine pointed upward from each end. Anal stigmata situated one on each side in end of anal plate next to and just inside of the spine. At outer end of anal plate on each side is a chitinous black ocellus. Ventral surface of body has spinose areas at junction of segments, being eleven half rings of microscopic spines, the front one faint and situated opposite the pharyngeal sclerites, the hind one on the subanal proleg-like hump or tubercle. Dorsum of body without spines or spine areas. Thirteen segments appear marked by integumental divisions, and counting the apparent second segment as II. and III. the total is fourteen, XIII carrying the subanal tubercle and XIV. the anal plate, though the last is small and ill-defined.

The maggot jumps by curling the body until the head and anal plate meet, the mandibular hook being appressed ventrally to the dorsal surface of the anal plate, whose lateral hooks are dorsally directed, the anal plate being then forcibly thrust free from the mandibular hook by a sudden and rigid straightening of the body from the anal end, while the mandibular hook is maintained continuously at resistant tension. This produces the leap, probably after the same manner as in the maggot of *Piophilæ*. While the body is curled, the ventral surface represents the concavity and the dorsal the convexity of the curve assumed. Probably this jumping power of the maggot has been developed for the purpose of escaping the ants or other enemies when the flower is abandoned for pupation in the soil.

On January 26 the maggots were found to have issued from the bloom. Soil was supplied to three of them, into which two of them immediately entered, but the third had already begun to contract for pupation and remained on the surface. Issuance had not taken place up to some fifteen or twenty days after, but on February 27 the three flies were found issued, perfectly transformed, and dead. The pupational period is evidently close to

three weeks. The fly is of unusual interest on account of the long and extremely needle-like ovipositor of the female.

ACUCULA, gen. nov.

Head flattened or shortened-subhemispherical, in form approaching that of *Milichia*, but longitudinal axis less. Front of male about three-fifths of eye-width, that of female about eye-width. A pair of reclinate and slightly convergent vertical bristles, a pair of reclinate orbitals in front of ocelli, a pair of proclinate ocellar bristles, these all being equal in strength and length; rest of parafrontals with fine hairs half the length of the bristles. Antennæ inserted below eye-middle, reaching about three-fifths way to oral margin, third joint somewhat elongate, arista short-pubescent. Peristomalialia with five or six equal bristles, the vibrissæ not differentiated. Eyes descending to lower margin of head in profile, the cheeks narrow. Proboscis and palpi short, not exerted, the oral cavity rather pronounced.

Mesoscutum with bristles near posterior border only, short hairs on rest; scutellum subtriangular but rounded apically, bearing a pair of apical and a pair of lateral bristles slightly longer than those of mesoscutum. Abdomen broad in both sexes, as broad as, or slightly broader than, the thorax, suddenly narrowed at base; oblong and flattened in male, slightly arched in female, but also flattened and shortened-subrounded rapidly tapering apically. Male hypopygium rather small. Ovipositor three-jointed; the basal joint widened and flattened, about as long as basal width; second and third joints equal and twice as long as basal or nearly that, the second a little wider than thick, the third filiform needle-like, with microscopically sharply-pointed tip and evidently telescoping within second joint; whole ovipositor conspicuously longer than female abdomen, but about as long as abdomen of male. Legs short, normal in both sexes; the hind metatarsi a little elongate, middle and front ones successively less so; middle tibiæ with very weak short apical bristle. Auxiliary vein coalesced with first vein throughout, latter ending a little before small crossvein; apical cell not narrowed, second basal and anal cells distinct; hind crossvein about half way between small crossvein and point where

fourth vein reaches wing margin; a slight emargination of costa at end of first vein.

Type: *Acucula saltans*, n. sp.

Acucula saltans, n. sp.

Length of body of male, 5 mm.; body of female to end of extended ovipositor (axis of abdomen and ovipositor flexed to axis of thorax), 7 mm.; ovipositor, 3 mm.; wing, 4 to 4.5 mm.. Two males and one female reared from maggots found in cactus bloom at Santa Ana, Rio Rimac Valley, Peru, about 4,000 ft.

Wholly bluish-greenish black, polished, metallic; eyes, face and antennæ brown; face slightly cinerous in oblique lights; legs brown, tibiae tawny or obscure yellowish. Wings clear, tawny whitish at base.

The eggs are evidently deposited within the cactus bud at a certain stage of development of the latter, the elongated needle-like ovipositor being used for piercing the wall of the bud. The maggots evidently feed on the fermenting juices of the flower mass, whose development is arrested by their presence.

This fly appears to be intermediate between the *Milichiidae* and the *Sepsidae*, partaking largely of the characters of both. The head, abdomen, wings, legs and vibrissæ are more like *Milichia*; while the frontal characters and larval habits are more like *Sepsis*. The larval saltatory habit finds its only known counterpart in *Piophilæ*. The fly is probably to be considered an aberrant member of the *Sepsidae*, certainly so if the saltatory habit signifies anything.

OVIPOSITION HABITS OF *CULEX ABOMINATOR* DYAR AND KNAB.

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To the best of the writer's knowledge, the oviposition habits of *Culex abominator* have not been published, and, as they are unique for a species of *Culex*, they are perhaps worthy of note.

The larvæ of this species are indigenous to the beds of aquatic vegetation which frequently form in the rivers and lakes of the north-central states. These beds are composed of *Ceratophyllum*, *Potamogeton*, *Lemna* and similar aquatic plants. This growth is more or less impervious to fish, but provides sufficient open water surface to allow the breeding of great numbers of mosquitoes.